

CLAIMS

1. A method for feeding a mixture comprising a burnable solid and water to a combustion furnace or gasification reactor, comprising heating the mixture with a heater to convert at least a part of the water in the mixture into a form of steam and feeding the whole mixture to a combustion furnace or gasification reactor, wherein the whole mixture is transferred between the heater and the combustion furnace or gasification reactor by a pump, characterized in that a discharge pressure at the pump is higher than an inner pressure in the combustion furnace or gasification reactor at least by 1.5 MPa and not higher than 22.12 MPa, and that a flow rate of said mixture with at least a part of the water being in a form of steam is from 6 to 50 m/s in a pipe in the heater and in a pipe between an outlet of the heater and an inlet of the combustion furnace or gasification reactor.
2. The method according to Claim 1, wherein a discharge pressure at the pump is higher than an inner pressure of the combustion furnace or gasification reactor by from 3.0 MPa to 15.0 MPa.
3. The method according to Claim 1, wherein a discharge pressure at the pump is higher than an inner pressure in the combustion furnace or gasification reactor by from 4.0 MPa to 15.0 MPa.
4. The method according to any one of Claims 1-3, wherein said flow rate is from 8 to 40 m/s.
5. The method according to any one of Claims 1-3, wherein said flow rate is from 10 to 40 m/s.
6. The method according to any one of Claims 1-5, wherein an inner diameter of the pipe in the heater becomes larger gradually along a direction of the flow of the mixture, so that the water in the mixture is gradually converted into a form of steam.
7. The method according to any one of Claims 1-5, wherein an inner

diameter of the pipe in the heater becomes larger stepwise along a direction of the flow of the mixture, so that the water in the mixture is stepwise converted into a form of steam.

- 5 8. The method according to Claim 7, wherein a pressure reducing valve is provided between sections of the pipe with different diameters, so that the water in the mixture is converted into a form of steam with an aid of the pressure reducing valve.
- 10 9. The method according to any one of Claims 7 and 8, wherein an inner diameter of the pipe in the heater becomes larger in from 2 to 12 steps.
- 15 10. The method according to any one of Claims 7 and 8, wherein an inner diameter of the pipe in the heater becomes larger in from 4 to 12 steps.
- 20 11. The method according to any one of Claims 7 and 8, wherein an inner diameter of the pipe in the heater becomes larger in from 6 to 12 steps.
- 25 12. The method according to any one of Claims 7-11, said non-flammable gas is blown in just downstream of a place where the inner diameter of the pipe becomes larger.
- 30 13. The method according to Claim 12, wherein said non-flammable gas is steam, nitrogen, or carbon dioxide.
- 35 14. The method according to any one of Claims 1-13, wherein substantially all of the water is converted into a form of steam.
15. The method according to any one of Claims 1-14, wherein the heating by the heater is carried out at a temperature of from 150 to 450 degrees C at a pressure of from 1.5 to 22.12 MPa.
16. The method according to any one of Claims 1-14, wherein the heating

by the heater is carried out at a temperature of from 200 to 400 degrees C at a pressure of from 3.0 to 22.12 MPa.

- 5 17. The method according to any one of Claims 1-14, wherein the heating by the heater is carried out at a temperature of from 200 to 365 degrees C at a pressure of from 4.0 to 20.0 MPa.
- 10 18. The method according to any one of Claims 1-17, wherein the heating is carried out with a heating medium of a temperature of from 200 to 600 degrees C.
- 15 19. The method according to any one of Claims 1-18, wherein a pressure control valve is provided between the outlet of the heater and the inlet of the combustion furnace or gasification reactor.
- 20 20. The method according to any one of Claims 1-19, wherein a pre-heater is provided upstream of the heater.
- 20 21. The method according to Claim 20, wherein a pressure reducing valve is provided at the outlet of the pre-heater.
- 25 22. The method according to any one of Claims 1-21, wherein a water content in the mixture comprising a burnable solid and water is from 27 to 80 weight %, relative to the total weight of the mixture.
- 25 23. The method according to any one of Claims 1-21, wherein a water content in the mixture comprising a burnable solid and water is from 30 to 40 weight %, relative to the total weight of the mixture.
- 30 24. The method according to any one of Claims 1-21, wherein a water content in the mixture comprising a burnable solid and water is from 30 to 35 weight %, relative to the total weight of the mixture.